

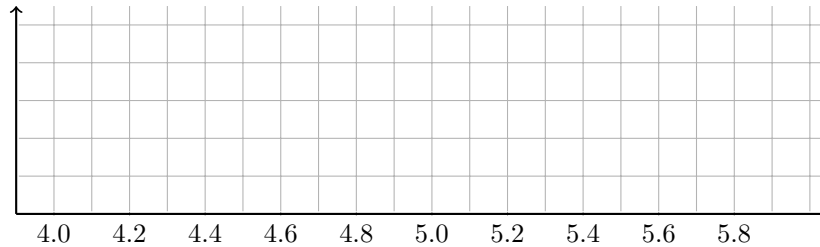
Name: _____

1. (15 points) Researchers measure the fasting glucose levels (in mmol/L) of 200 girls ages 10.0–10.5. The results are summarized in the table below.

Fill out the table with the midpoint, relative frequency, and cumulative frequency for each class.

Class	4.0–4.4	4.5–4.9	5.0–5.4	5.5–5.9
Midpoint				
Frequency	30	84	66	20
Relative Frequency				
Cumulative Frequency				

2. (15 points) For the same data as in the previous question, sketch the relative frequency histogram on the axes below, labelling the y axis.



3. (15 points) For the same data as in the previous question, find the computed mean (i.e., weighted average).

3. _____

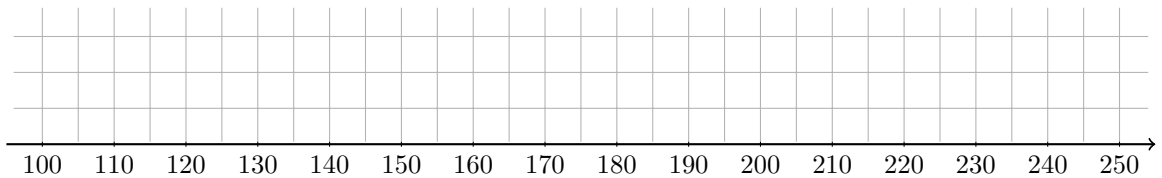
4. (15 points) Researchers measured the total cholesterol level in mg/dL for a random sample of 159 residents of the community. The measurements have been tabulated and ordered from smallest measurement to largest measurement below.

112 112 112 112 113 117 119 120 120 123 123 126 128 128 129 129 129 129 129 131
 133 134 134 134 134 134 135 135 135 137 141 141 141 144 144 144 144 144 144 145
 146 146 147 148 148 148 148 148 148 149 149 150 150 150 150 153 153 153 153 153
 153 154 155 158 160 160 160 160 162 162 162 164 164 165 169 170 171 171 171 172
 173 173 174 174 174 174 174 178 178 178 178 178 179 179 179 179 180 180 180 182
 186 186 186 186 186 188 190 194 196 196 197 198 201 201 204 205 205 205 206 209
 210 210 210 214 214 215 215 215 215 217 217 219 219 223 223 223 223 223 223 223
 224 226 230 230 230 231 234 235 235 235 235 239 239 239 239 242 243 244 244 245

- 4a. Find the minimum x_1 , first quartile q_1 , median q_2 , third quartile q_3 , and maximum x_n of the dataset.

4a. _____
 x_1 q_1 q_2 q_3 x_n

- 4b. Graph the data in a box plot on the axis provided.



5. (10 points) Human leukocyte antigen (HLA) is a protein found on most cells in your body and is used to match a patient with a donor for a bone marrow transplant. The probability that two unrelated people are an HLA match is 1 out of 20 000. Suppose a patient needs a bone marrow transplant and has no siblings. What is the chance that the patient finds a suitable donor in a registry of 30 000 donors, none of which are related to the patient?

5. _____

6. (10 points) The following are the SAT scores of 8 randomly chosen college-bound high school seniors in 2020

949, 991, 812, 1292, 1211, 901, 983, 1119

6a. Find the mean, median, variance and standard deviation of this sample.

6a. Mean: _____. Median: _____. Variance: _____.

Standard deviation: _____.

6b. If the mean SAT score of all college-bound high school seniors was normally distributed, with a mean of 1051 and a standard deviation of 211.2, then find the interval centered around the mean that contains 68% of all the scores in the population.

6b. Lower bound of the interval: _____.

Upper bound of the interval: _____.

6c. What is the relative frequency of the scores in the sample that fall in the interval you found in (b)?

6c. _____

6d. Would you generally expect that relative frequency to be close to 68% or not, and why do you think so?

6d. _____

7. (10 points) It is well-established that the lifetime risk for brain cancer in the general population is 0.62% (i.e., 0.62% of people will develop a primary malignant brain/CNS tumor during their lifetimes). However, the brain cancer risk for vineyard workers may be higher due to the use of pesticides. To test whether this is the case, researchers surveyed all 74 143 people that worked on vineyards between 1984 and 1986, and found that 519 developed a primary malignant brain/CNS tumor later in life. Construct a 95% confidence interval for the lifetime risk for brain cancer in vineyard workers.

7a. Find the critical value $z_{\alpha/2}$.

7a. _____

7b. Find the error $E = z_{\alpha/2} * \sqrt{\hat{p} * \hat{q}/n}$.

7b. _____

7c. Find the confidence interval $\hat{p} - E < p < \hat{p} + E$.

7c. _____ $< \mathbf{p} <$ _____

8. (10 points) Suppose that in a random sample of 200 smartphone users, 63 used an iphone. Conduct a hypothesis test at significance level 0.03 to test the claim that less than 36% of smartphone users use an iphone.

8a. State the null hypothesis.

8a. _____

8b. State the alternative hypothesis.

8b. _____

8c. Find the P-value.

8c. _____

8d. Formulate your conclusion

8d. _____